

## Experimenting with emotions: insights into empirical emotion research in cognitive translation studies

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## 1. Introduction

We all have good days and bad days. On a good day, we are usually full of energy and ready to win the world; these are happy days when everything seems to go well. On a bad day, by contrast, we do not feel like getting out of bed; these are sad days when everything seems harder. It is the effect of emotions on our lives. Emotions play a decisive role in how we think and behave. Our daily actions and decisions, both large and small, can be influenced by our emotions.

The positive or negative consequences of emotion are largely assumed to depend on the type experienced; positive emotions are associated with positive outcomes and negative emotions with negative outcomes. However, results of extant research suggest that emotional consequences are far more complex and that investigating emotions requires a more flexible approach (An et al., 2017). Emotional consequences are not straightforward; valence or evaluation (i.e., positive to negative) and level of activation (i.e., high to low) play a role, but so do the type of situation and task, as well as our cultural experiences and individual traits, among many other things. Emotions are reported to have simultaneous positive and negative consequences and even conflicting ones. There are situations where people are likely to report feeling simultaneously happy and sad—e.g., on moving away from home (Larsen et al., 2001) or when losing in a relieving fashion (Larsen et al., 2004). Positive emotions may lead to negative outcomes—e.g., Gruber et al. (2011) demonstrate that people pursuing happiness strongly tend to feel more miserable and depressed—and negative emotions to positive outcomes—e.g., Tamir and Bigman (2014) show that anger may lead to better performance on confrontational tasks. The classification of emotions as positive or desirable can also vary across cultures. Americans, for instance, value high-arousal positive affective states, such as excitement, whereas East Asians value low-arousal ones, such as calm or peacefulness (Tsai, 2007). Individual factors also play a key role in mediating emotional outcomes. Emotional consequences depend, to a great extent, on our ability to feel and respond to our emotions, something which has implications for psychological and physical well-being (Luong et al., 2016).

Emotions are felt to pervade our lives, ruling over our personal and professional life. Most studies have provided evidence on how emotions can negatively alter cognition (e.g., Pourtois et al., 2013), which has fed the long-held expectation that people should keep their emotions out of the workplace, building boundaries between their personal and professional lives. But the truth is that this is not possible. Research on neurobiology (Okon-Singer et al., 2015) has shown that emotion and cognition are deeply interwoven in our brain. Emotions, such as stress, anxiety or other kinds, can affect cognitive processes related to attention, memory or executive control. And circuits involved in these cognitive processes can contribute to the regulation of emotion. People cannot easily escape the influence of emotions while performing a cognitively demanding task, but have, in turn, on-hand cognitive mechanisms to regulate this influence.

This volume explores the interplay between emotion and cognition in the translation and interpreting process. This introduction shows a thumbnail sketch of the pros and cons of experimental research on emotions in cognitive translation and interpreting studies (CTIS, henceforth). Later, new empirical insights are provided by four papers that investigate the emotional experiences of student translators and both trainee and professional interpreters while engaging in a translation and interpreting task. The volume also includes two papers that address the question of how these emotional experiences are made accessible to visually impaired audiences. The introduction closes with a brief reflection on the future of emotion research in translation and interpreting studies.

## **2. The fundamental contradictions and contingencies of experimental research in CTIS**

Empirical research relies on the observation and measurement of phenomena to arrive at the best possible outcomes. Emotion cannot be directly observed or measured, but its effects can. Since emotion events are complex scenarios difficult to measure and control, experiments offer researchers a convenient methodology to manipulate a set of defined variables in order to trace cause-and-effect relationships between them. However, experimental research on emotion faces major contradictions and constraints on causal inference that should be considered in order to draw valid inferences from results.

### **2.1. The emotion paradox and multi-method research**

Research on emotions faces a fundamental paradox—what Barrett (2006) has labelled as the emotion paradox—between their perceived omnipresence as natural categories and the lack of irrefutable scientific evidence in favor of their existence. We take emotions for granted; we think of them as regularly patterned categories whose effects can be easily recognizable in our own and others' behavior. And yet, scientific research has failed to demonstrate the existence of invariant patterns within and between individuals. A smile, for instance, can be associated to happiness, sadness or even contempt, depending on the person and/or situation. As previously outlined, emotional effects depend on valence and level of activation, but also on the type of situation and task, and on people's cultural experiences and individual traits.

The research corollary of the variability and unpredictability of emotion is the adoption of a multi-method approach combining physiological, self-report and performance measures. Emotion feels perceptible, but is rather an intangible, abstract concept that can be only indirectly researched. We cannot dissect emotions, but we can make informed predictions on their nature and workings by measuring their physiological effects. However, research based solely on these physiological effects runs the risk of missing the target. Imagine the aim is to identify the sources of stress in conference or simultaneous interpreting, a topic already researched in CTIS (e.g., Klonowicz, 1994; AICC, 2002; Moser-Mercer, 2005; Korpál, 2016, 2017;

Chernigovskaya et al., 2019). Interpreters' high heart rate, blood pressure and body temperature measures will be most likely understood as a response to stress from the interpreting context. But given that similar activation of the sympathetic nervous system (e.g., an increase in heart rate and body temperature) may occur for negative (e.g., fear) and positive (e.g., joy) emotions, and that some responses that are not primarily emotional (e.g., fever or exposure to heat) may lead to similar visceral changes to those claimed for some emotions, how can we know that these symptoms are actually a response to stress from the interpreting task? Extreme fatigue, consumption of certain chemical substances or even anxiety from marital, financial or other external problems are also possible causes for the described symptoms.

Increasing experimental control over the independent variable can be of assistance, testing the effects of a specific factor, such as prolonged turns (Moser-Mercer et al., 1998) or a high delivery rate in interpreting (Korpál, 2016, 2017). But the rigorous control of the independent variable may not necessarily rule out other intervening factors that should also be controlled for. So far, most studies on stress in interpreting have taken the stressful nature of the task for granted, assuming a response to stress and overlooking the interpreter's conceptualization of their own experience. Some studies have combined physiological and self-report measures, but these have been mainly used to measure participants' levels of anxiety—e.g., Spielberger's (1989) State-Trait Anxiety Inventory (STAI)—or affect—Watson et al.'s (1988) Positive and Negative Affect Schedule (PANAS)—, or to gather additional information on their opinions about sources of stress or its effects on interpreting performance (AIIC, 2002). And yet, a further effort is needed to inform on the interpreter's conceptualization of the event as a reliable method to strengthen casual inference and discard interfering emotional states.

Physiological and self-report measures of emotion should go hand-in-hand, but evidence (e.g., Kassam & Mende, 2013) showing that the act of reporting on emotional states can alter the neural and physiological concomitants of emotion also calls for methodological caution. Self-report data should always be collected after and not before emotion manipulations to avoid awareness and introspection to alter the emotional response. To this respect, retrospective protocols and surveys appear as valuable self-report instruments to provide in-depth data on translators' and interpreters' emotional experiences (see papers by Gumul and Walczyński, in this volume).

The use of physiological and self-report measures should suffice to identify a specific instance of emotion, but CTIS are also interested in describing emotional effects on performance (e.g., Lehr, 2014; Naranjo & Rojo, 2020; Rojo & Naranjo, 2021; Rojo & Ramos, 2016, 2018). Characterizing the behavioral indicators—both the rights and wrongs—of a specific emotion can help not only to understand the nature and scope of the emotional experience, but also to regulate its effect on translation and interpreting performance. The majority of studies researching the effects of emotion on performance assess product quality by analyzing errors and successes. But there are also a few attempts at exploring the influence of emotion on the time needed

to find a translation (Ramos & Rojo, 2014; Rojo & Meseguer, in this volume). However, as useful as this combination may be from a theoretical, and even practical, point of view, existing attempts to do so are still scant and higher precision and uniformity are needed in defining performance measures and scoring parameters. Assessment of translation or interpreting output will vary depending on the criteria and parameters adopted, so these should be published and clarified to facilitate the replicability of empirical findings. Likewise, reliability for the assessment process is to be established by using inter-rater agreement metrics.

The combination of physiological, psychometric and performance measures appears as the most reliable practice to determine the nature of emotional phenomena. Physiological data inform us of the intensity and valence of affect which we may not even be aware of. Self-report and tailor-made questionnaires are recommended to obtain additional information on the conscious emotional experience and rule out any potential bias or first-hand experiences that may interfere with the results. Performance or behavioral data serve to understand the scope of the emotional effects and regulate their impact. But multi-method research is no quick fix, and there is still the need to define what CTIS researchers understand as an emotion, reaching a consensus on methods of analysis and research standards. An important consequence of using multiple data collection methods is the need for more sophisticated methods of statistical analysis beyond linear statistics and static models (see the APA webpage for a brief description of complex nonlinear dynamic methods and nonlinear time-series analysis techniques)<sup>1</sup>. These models and techniques embrace the complexity of human behavior and acknowledge that the dynamics or causal processes underlying human behavior are nonlinear.

## **2.2. The contradiction between ecological validity and experimental control**

Another crucial methodological issue in emotion research in CTIS refers to the need for balancing ecological validity against experimental control to guarantee that data are representative and generalizable to a broader population. Experimental control allows for unique causal inference, ruling out extraneous variables. Experiments are also a valuable alternative for participants and contexts that are difficult or impossible to access and control, such as refugee camps, hospitals or prisons, but they miss part of the richness of real-world settings. As a consequence, the link between the variables observed in real-world situations and those manipulated in controlled settings is at times rather loose. When emotion is concerned, the link is weak because controlled settings have a deterrent effect on emotion. Experimental anticipation usually brings about higher anxiety and stress levels, which may, in turn, interfere with the emotions under test. Time constraints make it difficult to use texts or stretches of speech long enough to trigger an emotional reaction.

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1 <https://www.apa.org/science/about/psa/2017/02/dynamical-phenomena>.

Instrumentation does not help either; translators and interpreters are most likely to feel stressed when attached to physiological equipment, and experimental stress may prevent emotional reactions triggered by the stimuli content. When physiological measures are combined with different self-report questionnaires, participants may be overwhelmed by the task—especially when having to complete the same test at different points throughout the experiment—and provide rather loose answers.

The validity of tests and questionnaires for measuring emotion is also a thorny issue. Participants may not feel comfortable writing their real emotions down and may distort them conforming to social desirability issues. Reliability of test scores is to be calculated for the specific sample population being tested (Mellinger & Hanson, 2020). Social desirability bias and non-response are also tricky issues in surveys. In contrast, surveys can reach a much larger sample of the population and provide more detailed information on a particular emotional event and experience.

### **2.3. The ethical conflict between informed consent and experimental bias**

Ethical issues are also a pressing challenge in emotion research in CTIS. One of the basic premises of ethical research is to inform participants of their responsibilities and research risks before they grant their consent to participate. Stating or explaining the purpose of the research is one of the first steps to inform participants. Compliance with informed consent often obliges researchers to compromise between providing the necessary information to guarantee that prospective participants understand the experimental procedure and omitting details that may bias their response. In the case of emotion research two issues that may influence participants' responses are knowledge of the specific emotion to be triggered and awareness of the simulated nature of the situation. Emotion researchers often face what Lakoff (1990) described in linguistics as the 'do not think of an elephant' effect, i.e., if you negate a frame, you necessarily have to activate that frame in your mind and hence think of it. Telling participants about the specific emotion targeted in the research would evoke this emotion in their minds, which would, in turn, bias their emotional response. In contrast, not telling participants may expose them to psychological distress. Take, for instance, the case of Ramos et al.'s study on the reception of audio described porn in this volume. Participants needed to be informed of their exposure to porn clips, but did not need to know that the design specifically aimed at testing the effects of audio described vs. audio visual porn. How do researchers decide on what needs to be communicated and what is best left unsaid? Researchers and ultimately ethical committees at research institutions have the last word in deciding what and how much information should be provided to participants without jeopardizing their psychological well-being and emotional responses.

The case becomes much more complex when recruiting participants with a disability, such as visually impaired populations in reception studies (see for instance, the already quoted

paper by Ramos et al. or the work by Iturregi-Gallardo & Soler-Vilageliu in this volume). Environmental stress responses are frequent in experimental settings. Participants often grant their consent and are informed of the protocol minutes before the experimental intervention takes place. They thus arrive to the experimental setting without knowing what to expect and fearing the unknown. In addition, protocols usually require participants to perform a set of tasks during which they feel observed and evaluated. All these factors are likely to trigger stress responses that may interfere with the effects of the independent variable. Hearing and visually impaired populations require protocols to be adapted to their special needs. Visually impaired participants, for instance, cannot complete questionnaires unless they are provided with the adequate tools, so researchers may need to read the questions out loud to them. When questionnaires demand intimate information, such as details on their sexual or love life, they may feel intimidated, shameful or even annoyed with the increasing risk of social bias response. Work with special needs population requires special care to inform them in reasonable anticipation of the experiment, making them feel as comfortable as possible.

### **3. Emotion in CTIS research: insights from six empirical studies**

This section introduces and summarizes the results from six empirical studies that investigate the emotional experiences of student translators, professional interpreters and audiences with special needs.

In “The effect of attitude towards Catalonia’s independence on response latency when translating ideologically conflicting press headlines”, Rojo and Meseguer introduce a groundbreaking experimental study that explores the role of the affective charge of sociopolitical concepts when reading and choosing an adequate translation for newspaper headlines on Catalonia’s independence conflict. They use a crossed design to measure translation students’ reaction times when presented with a literal translation versus a pro- or an anti-independence option. Results from the study do not reach statistical significance for the predicted interaction between the translation students’ ideological stance and the content of the source text or that of the translation options. But interesting differences are revealed between the comprehension and the translation stage. When the newspaper headlines are congruent with participants’ ideology, they take longer to understand them, but are faster in choosing an adequate translation. Rojo and Meseguer argue that a plausible explanation for the apparently impeding effect of ideological congruency during the reading comprehension stage may be the participants’ allocation of greater attentional resources, causing slower response latencies. Overall, this paper provides intriguing evidence on the impact of political stance on the translation process.

As for interpreting, extant research on emotion has focused on exploring the impact of stress and anxiety on interpreters’ working conditions and performance, feeding on simultaneous and conference interpreting as main working contexts. In this sense, the paper by

Walczyński's "Will I make it or will I make a fool of myself: Polish-English certified interpreters' experience of anxiety" ventures into the relatively unexplored context of court interpreters' emotional experience. Walczyński's study uses an online survey to investigate Polish-English certified court interpreters' experience of anxiety. Participants are asked about the types of mistakes they make and the bodily reactions they experience during consecutive interpreting. Drawing on how certified court interpreters conceive of themselves and their practice, the author identifies two main sources of interpreters' anxiety, namely, lack of self-confidence and uneasiness about the institutional context, as well as other people taking part in the communicative acts. Interpreters' comments evidence that anxiety hinders the production of a grammatically, lexically and phonetically correct output, and results in body tension, increased sweating, dry throat, shallow breathing and accelerated pulse, among other physiological indicators. The paper closes with some concluding remarks on the implications of research for interpreting training, such as the convenience of using aptitude admission tests or supportive interpreter training settings offering psychological coaching and strategies to mitigate the potential negative effect of psychoaffective factors on interpreting performance.

Gumul's paper "Reporting stress in simultaneous interpreting. The analysis of trainee interpreters' retrospective reports and outputs" focuses on simultaneous interpreting, but uses self-retrospection as a rather innovative method to research stress. Gumul uses unguided self-retrospective verbal protocols to explore sources of stress in simultaneous interpreting as well as trainee interpreters' stress-prevention and coping strategies in both interpreting directions. After an exhaustive review of the existing literature on simultaneous interpreting and, in particular, on physiological and self-report measures, the author focuses on the linguistic indicators of stress reported in trainees' L1-L2 and L2-L1 interpreting. Results from the study reveal a considerable difference in the amount of reported stress between both interpreting directions, with a higher number of verbalizations reporting the experience of stress being detected in L1-L2 interpreting. Delivery rate and interpreting failure head the list of factors perceived as stressors, whereas omission is the trainees' main coping strategy. Moreover, the analysis of interpreting performance points to hesitation markers and anomalous pausing as indicators of the negative effect of stress on fluency, which the author attributes to the trainees' competence levels. Gumul's work shows that interpreting trainees suffer from psychological stress even if their problems differ from those of professionals in real work environments, and demonstrates that self-retrospective protocols can provide useful insights into the subjective experience of stress.

Even if stress has taken center stage in interpreting research, recent work points to the relevant role of emotionally laden stimuli. A good example is Korpál and Jankowiak's paper "On the potential impact of directionality on emotion processing in interpreting", which explores the effect of directionality (L1 Polish – L2 English, L2 English – L1 Polish) and valence on emotional response in interpreting. Empirical research on directionality in interpreting

has mainly focused on cognitive effort, but its impact on the processing of emotional stimuli has not been empirically addressed. In this pilot study, the authors triangulate data from a self-report measure (the Polish adaptation of the Positive and Negative Affect Schedule) and a psychophysiological marker (skin conductance or SC). Their results show a stronger emotional response (reflected only in SC) in the process of interpreting negatively-valenced stimuli as compared with neutral ones, irrespective of the interpreting direction. The authors attribute the limited impact of directionality to interpreters' professional experience in interpreting in both directions. Although no statistically significant differences are observed between interpreters' emotional response to negatively-valenced stimuli in both directions, the pattern suggests that interpreters are more affected by experimental stimuli while interpreting into their L1. Results from the paper indicate that interpreters are emotionally engaged when processing emotional material. Recommendations are provided to prevent professional interpreters from chronic stress and occupational burnout, as well as to include emotional coping strategies in interpreter training.

The volume closes with two papers that explore how emotional experiences are made accessible to visually impaired audiences. Ramos, Espín and Rojo's paper "The psychophysiological impact of audio described porn" addresses the question of whether audio described porn can evoke a similar emotional response in a visually impaired female audience to the one elicited by audiovisual porn in sighted women. The authors combine data from heart rate monitoring and three self-report questionnaires on affect and sexual reactivity (The Positive and Negative Affect Schedule or PANAS; The Sexual Inhibition/Sexual Excitation Scale or SIS/SES; and The State-Trait Anxiety Inventory or STAI). Results from the study indicate that audio described porn is capable of eliciting a similar emotional response to the one evoked by the original audiovisual scenes. Data reveal that the experimental task does not have any significant effect on both audiences' affective state. The decrease in heart rate reported is interpreted as a possible attentional response to the stimuli. This work is a significant contribution to accessible media communication that places the spotlight on the need to facilitate visually impaired women's access to porn.

Equally significant is the contribution by Iturregui-Gallardo and Soler-Vilageliu's paper "Audio subtitling and subtitling: a comparison of their emotional effect on blind / partially sighted and sighted users". This work introduces two experiments that explore the emotional impact of audio subtitling and subtitling based on a self-report measure (i.e., The Self-Assessment Manikin questionnaire) and two physiological markers (SC and heart rate). In the first experiment, the authors explore the emotional arousal experienced by blind and partially sighted participants when hearing three different clips: one for fear, one for sadness and a neutral one. In the second experiment, sighted participants are exposed to the same stimuli with subtitling. Overall, self-report results suggest that both subtitling and audio-subtitling are able to elicit a similar subjective perception of emotion in terms of valence and arousal. As expected, sadness and fear are rated as more negative than neutral, and fear is rated higher in

arousal than sadness and neutral. As for physiological data, results are not conclusive. Even if differences are reported for SC data, with sighted participants experimenting higher arousal than blind during the neutral clips, heart rate data show no significant differences between the two groups. The authors highlight the importance of combining both subjective and objective measures and instruments to enable better assessment of accessibility services.

#### **4. A closing note on the near future of emotion research in CTIS**

CTIS scholars have invested great effort in recent years to define and explore the role of emotion and other related affective factors in the translation and interpreting process. Work in this special issue illustrates the progress made by CTIS research towards multi-method approaches that combine self-report and physiological data collection tools. And yet, a number of pending challenges still lie ahead for future research. Many have already been outlined in this introduction when discussing the contradictions and contingencies of experimental research in CTIS. But we offer here a quick summary of where they lie and where they are leading to.

Emotion is now claimed to be inextricably linked to cognition, but further research is needed to uncover how cognitive and affective processes interact during the translation and interpreting process, and what factors mediate the interplay. Some of these factors are intrinsically driven, such as affective related traits or beliefs, but others are extrinsically motivated, such as those resulting from the socioeconomic and political context (e.g., Rojo & Meseguer's work in this volume), or even those from the work environment: furniture, equipment they are using, CAT tools, working conditions, time management, relations with other colleagues/clients, degree of involvement in decision making, etc. (see, for instance, O'Brien & Ehrensberger-Dow, 2015; Ehrensberger-Dow, 2017). More research is needed on how workplace ergonomics can affect emotional processes.

Besides existing gaps in our knowledge on the impact of emotional processes on translation, emotion research still faces important methodological challenges related to emotion measurement. The papers in the present volume point to multi-method research as the right way forward, but many obstacles still impede progress. A major difficulty arises from the apparent lack of agreement between self-report measures and physiological indicators. As seen in the two papers on accessibility in the present volume, whereas statistically significant effects are reported for self-report or subjective measures, physiological data often fail to reach significance or display unexpected patterns (as in the decrease in heart rate reported in Ramos et al.'s paper). Experimental anxiety or even increased attention may influence physiological response, masquerading the effect of emotional stimuli.

Another crucial issue related to performance assessment is the lack of uniform parameters. We need standardized criteria for quality assessment and the selection of comparable source

texts and discourses. Most experiments compare source texts according to linguistic criteria, such as readability indices (e.g., the Flesch-Kincaid Readability score) and word frequency. And yet, comparable readability does not equal similar translation difficulty or emotional impact. We need corpora of texts and discourses comparable for emotional valence and arousal as well as for translation difficulty in different source languages. Similarly, reception studies would also benefit from emotionally laden stimuli designed for audiences with special needs, which incorporate audio description and audio subtitles for visually impaired audiences or subtitles for the hearing impaired.

Finally, when researching emotions, ethical issues are paramount. In recent years, experimental ethics have been much strengthened by ethical committees at research corporations and institutions, but we must remain vigilant and keep working to minimize participants' distress. A relevant milestone in this case is the development of less intrusive tools to measure physiological markers, such as the Empatica E4 wristband (Empatica Srl, Italy), which allows researchers to measure cardiac interbeat intervals (IBIs), heart rate variability (HRV) and electro-dermal activity (EDA), as well as several other acceleration and temperature measures (Milstein & Gordon, 2020). This wristband is much less invasive than the electrodes attached to participants' fingers or the heart rate band that requires researchers' assistance to place them around participants' chests. Emotion research still faces a journey full of questions and challenges to overcome. But CTIS scholars are indeed on the right track, well equipped with the latest data-collection technology and gearing up research towards the kind of interdisciplinary cooperation and multi-method approach best suited to pave the way for exploring affective events in translation and interpreting.

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